FORTY-SECOND

ANNUAL REPORT

OF THE

BOARD OF MANAGERS

OF THE

MONONGAHELA NAVIGATION CO.

TO THE STOCKHOLDERS,

WITH ACCOMPANYING DOCUMENTS,

PRESENTED JANUARY 12, 1882.

W. V. DERMITT PRINTER, 71 GRANT STREET, PITTSBURGH.

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J. K. MOORHEAD,
PRESIDENT.

W. BAKEWELL,
TREASURER.

Office Monongahela Navigation Co.

Pittsburgh, January 25, 1882.

STOCKHOLDERS' MEETING.

A special meeting of the Stockholders of the Monongahela Navigation Company, will be held at the office of said Company, No. 20 Grant Street, Pittsburgh, on TUESDAY, the 28th day of March, 1882, at 3 o'clock, P. M., for the purpose of considering and voting upon the question of increasing the capital stock of said Company, or the issue of bonds, or both, in order to raise funds for the erection of Lock and Dam No. 7 and new Locks Nos. 3 and 4, on the Monongahela river.

By order of the Board of Managers.

W. BAKEWELL,
Secretary.

To Jos F ~~Riggs~~ Griggs Treasr

Dear Sir:

I am instructed by the Board of Managers of the Monongahela Navigation Company, to send you the above notice, and to urge your personal attendance at said meeting. It is important to have as large a representation of the Stock of the Company as possible.

If you cannot be present in person, will you sign and send to me the enclosed proxy as soon as convenient, filling up the blank with the name of any person who will be present and act for you. You can, if you prefer to do so, insert my name, or that of J. K. Moorhead. I send you also a copy of our last annual report, on pages 9 to 11 of which, you will find a statement of the purpose and necessity of the proposed increase of Capital Stock or indebtedness.

Yours very respectfully,

W. BAKEWELL,
Secretary.

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PRESIDENT.

J. K. MOORHEAD.

SECRETARY AND TREASURER,

WM. BAKEWELL.

MANAGERS.

JOHN HARPER,
FELIX R. BRUNOT,
M. K. MOORHEAD,
N. B. HOGG,
WM. MORRISON,
J. B. MURDOCH,
ALEXANDER BRADLEY.
J. B. SWEITZER,
JOSEPH ALBREE,
A. C. BAKEWELL,

ANNUAL REPORT.

To the Stockholders of the Monongahela Navigation Company:

The year which has just closed has proved an eventful one to this Company, owing to the serious damage suffered by their works, and especially by Dams Nos. 1 and 3, which necessitated the expenditure of an extraordinarily large sum, amounting to considerably over fifty thousand dollars, to put them in a proper condition for the passage of boats.

Especial care is always taken by your Board of Managers to make all necessary repairs to the locks and dams in the Fall of the year in order to put them in good condition to resist the strain to which they are exposed, even in ordinary seasons, from the breaking up of the ice which forms readily in the comparatively still water of the slack-water pools, and to a greater thickness than is usual in navigable streams not intersected by dams. Accordingly an experienced man is constantly employed, whose special duty it is to look after this matter, to make a constant and close examination of the works, and to report upon and superintend the carrying out of any needed repairs. No expense, consistent with an economical and judicious expenditure of the funds of the company, is spared in this matter, as it is of the highest moment to the large and important coal trade of the Monongahela river, no less than to the best interest of the Company, to guard against those great enemies to slack-water improvement, broken ice and the impetuous torrent of water usually attending the passage of the ice out of the pools.

The winter of 1880–81 was, however, remarkable for the extremely low temperature which prevailed during a more than ordinarily long season. The navigation was closed by ice on December 25th, 1880, and the ice formed in the pools to a greater thickness than had been known for many years. This was a source of great uneasiness to the coal operators, who dreaded the effect of the break-up on the tipples at their works, and on the loaded coal barges frozen up in the river. In order, as they supposed, to avert the threatened danger, they concluded to cause an artificial removal of the ice by breaking it up by means of towboats, sufficiently to cause it to pass over the dams.

This operation was begun by the coal men on 11th January, 1881, when they commenced to break the ice by means of the towboats "Jos. Warne" and "D. B. Wood."

Previously to commencing this experiment, your President was visited by a Committee of the coal men, who stated what they proposed to do, and solicited a contribution from the Company towards the expenses of the operation. Your President expostulated with the Committee, and protested against their making so hazardous an attempt, predicting that if they persisted in their purpose, it would result in very serious injury, if not destruction, to the dams, stating to them at the same time, that his serious objection to the course which they proposed to pursue, and his refusal to contribute any money towards its being carried into execution, arose from the experience which the Company had in the winter of 1867–8, when the ice above the dams was broken up by the coal operators by means of towboats, the result of which was, as stated in our Twenty-ninth Annual Report, that "during the entire winter there was an unceasing flow of ice over the dam [No. 2], causing a constant abrasion of the lower sheeting, which wore it entirely through, and exposed to the action of the ice and water the lower cribs of the dam, which were thereby undermined and emptied of stone," costing the Company the sum of nearly forty thousand dollars for repairs.

This result having followed the attempt to prevent the accumulation of ice by running towboats up and down so as to break it up, your President, therefore felt sure that even greater damage would result from the breaking up of heavy ice which would necessarily pass over the dams in huge masses.

The coal operators, however, did not take the warning, and persisted in their attempt, with the worst results, as had been predicted to them. On 15th January, four days only after they commenced to break the ice, the work of destruction began. The ice, owing to the intensely cold weather, was extremely hard; huge masses lodged on the comb of the dams, until forced over by the accumulation of ice coming down from above. The consequence was, that the sheeting of the lower slope of the dam was torn off extensively; the damage was aggravated by the low stage of the water at that time, there being but a few inches passing over the comb of the dam, so that the ice, not having sufficient water to float it, exerted a violent abrading action on the wood work of the dam not only, but also carried away the stone filling. The result was, that one hundred and sixty feet in length of Dam No. 3 was torn off, down to the square, thus exposing that portion of the dam to the action of the water. Nothing could be done, although strenuous attempts were made, to arrest the progress of destruction; so that the foundation of that part of the dam which had remained uncovered and exposed to the action of the water, was carried away, making a break in the dam, and also washing away the bed of the river to a depth of more than thirty feet.

Our trouble, however, did not end here, for at a later period (February 8, 1881,) a similar break occurred in Dam No. 1, and from a like cause. This break was about the same length as that in Dam No. 3, but the bed of the river at this place was washed out to a greater depth, the maximum being nearly forty feet.

This second experience of an attempt to remove the ice artificially from the pools, has, we think, clearly demonstrated the fact, that large masses of ice, in the time of severely cold weather, and at a low stage of water, cannot be passed over a dam without the most destructive effect; whereas, the experience of other years in which the ice has been left in the pools to be broken up by the rise in the river following a thaw, during which the ice has become softened, and the amount of water is sufficient to float the broken ice, and thus lessen its effect on the dams, as clearly proves the wisdom of leaving the ice undisturbed in extremely cold weather, and until the natural conditions of temperature and water are such as permit of the passage of the ice with comparatively slight injury to the dams. This is also strikingly illustrated by the contrast of the effect of suffering the ice to remain during the last winter in Pools Nos. 5 and 6, until removed by the combined action of warmer weather and high water. The heaviest gorges of ice on the river occurred on those pools, and especially in No. 6; and yet, although these dams are several feet higher than Nos. 1 and 3, and therefore more liable to receive injury from the passing ice, little or no damage was done to them.

The very great importance of ascertaining the best course to be pursued in warding off the annually recurring danger from the breaking of the ice in the river, must be our excuse for dwelling at such length on the disastrous occurrences of last winter.

From the foregoing statement it will be readily perceived, that during the early part of last year the prospects for a successful and profitable business season were anything but encouraging. With two dams (and those which controlled a portion of the navigation over which the largest amount of coal was to pass), not only damaged, but partly carried away, with a river so high that it seemed impossible to hope to make any successful attempt to repair them, or even to check the work of destruction, we nevertheless felt it to be our duty to make an attempt to close the dams even temporarily. For this purpose immediate arrangements were made to procure the necessary boats, timber, stone and other material, and as soon as the water had somewhat subsided, efforts were made to close the break in Dam No. 1; these attempts were only attended with loss, delay and failure, until the river fell sufficiently to enable us to keep the cribs, designed to fill the gap in the dams, in their place. As soon as this had been so far successfully accomplished in Dam No. 1, as to back the water to Lock No. 2, we transferred a portion of our force of workmen to Dam No. 3; and the work on both dams was pushed so energetically that in the early part of July, both of the dams were restored, and the entire slack-water navigation put in successful working order.

It is a matter of congratulation, however, that, despite the fearful damage done to the works, and the heavy loss which it entailed on the Company in making such costly repairs, the navigation, although rendered somewhat inconvenient, was not seriously affected, as the high water and the broken condition of Dam No. 1, enabled boats to pass through the gap in that dam, and also some boats through Dam No. 3, after the foundation of that structure was carried away in May.

In our last year's report we mentioned our purpose of placing an engine on the wall of Lock No. 1, to aid in passing heavy coal boats and barges through the large lock; this has been supplied during the past year, together with machinery to effect the more rapid opening and closing of the lock gates. The result of these improvements is, that we can now pass two millions of bushels of coal in twenty-four hours. As an evidence of this we may state, that in twenty hours, between midnight of 17th December last and the same hour of the ensuing night, there were passed through Lock No. 1, forty-two coal boats, forty-six barges, ten flats and two fuel boats, containing together an aggregate of 1,661,000 bushels, or about 63,118 tons of coal. A correspondingly increased amount could have been passed during the twenty-four hours, had not the passage of boats been suspended during four hours of that day, by the refusal of the pilots of some towboats to pass down below, out of the way of the boats seeking to leave the lock. Such detentions are very annoying, but as the matter was fully referred to and explained in our last report, it need not be dwelt upon at this time, further than to remark, that if an early and sufficient appropriation be made by Congress for the completion of the Davis Island Dam, we are assured by the Engineers in charge of that Government work, that it can be completed during the present season. This will remove the cause of the difficulty complained of, as coal barges and boats can then at all times, be passed promptly into the pool below our Dam No. 1, which will be created by the Davis Island Dam.

The coal business on the Monongahela river has increased so largely in recent years, that the pressure for the passage of coal boats in time of a rise of the river, has become very great at Dam No. 3, where there is only a single lock. As the necessity arose, a similar difficulty at Locks Nos. 1 and 2 was relieved by the construction of a second and enlarged lock at each of those points. The Company has, therefore, in order to meet promptly the demands of the coal trade, and afford every facility for rapid navigation, ordered a new Lock, of larger dimensions than any heretofore constructed on their improvement, to be built alongside of the present Lock No. 3. This work will be put under contract and completed as speedily as possible; and they have it also in contemplation to duplicate the Lock at No. 4, also on an enlarged scale.

These improvements will fully accommodate, for many years to come, the still rapidly increasing coal trade out of Pools Nos. 3 and 4, especially when the formation of a pool below Dam No. 1 shall have been effected, as already alluded to.

The United States Government, having completed Lock and Dam No. 9, at Hoard's Rock, in West Virginia, are now proceeding with the construction of Lock and Dam No. 8, near Dunkard's Creek. If this work were completed it would only require the erection of Lock and Dam No. 7 by this Company to furnish a slack-water navigation between Pittsburgh, Pa., and Morgantown, in West Virginia, a total distance of one hundred and two miles.

This Company has accordingly entered into a contract with Messrs. Harrold & McDonald for the immediate erection of Lock and Dam No. 7, which, unless the season should prove so unfavorable as to prevent it, will be completed during the present year.

We are able, therefore, to congratulate our stockholders and the public, on the near prospect of the completion of this important work, which will prove of great value to the inhabitants of the Monongahela Valley, and will, we doubt not, open a market for the iron ores, coal and lumber of that region of country, and afford an avenue of trade and commerce of incalculable importance. It will, moreover, remove the obstruction to the navigation of the upper Monongahela which has existed ever since the erection of Lock and Dam No. 9 by the Government.

This work, when completed, will furnish on the Monongahela river the longest reach of slack-water steamboat navigation in the United States, if not in the world.

In view of the immediate prospect of the completion of this improvement, we may be permitted to invite our stockholders to a brief retrospect of the steps through which this important work has gradually, though steadily, and in spite of almost insurmountable difficulties and discouragements, been brought so nearly to a successful completion.

The charter of this Company was granted by the Legislature of the Commonwealth of Pennsylvania, in the year 1836, which authorized the construction of locks and dams to make a slack-water navigation from the city of Pittsburgh to the Virginia State line. The height of these dams was limited by that Act to four feet six inches, which was supposed to refer to the lift from pool to pool. A survey of the river, however, convinced the Engineers that it would be impracticable to construct the improvement with such limitation, as the pools would not, in some stages of the water, be deep enough, and the number of locks rendered necessary would prove too much of an obstruction to navigation. On those facts being presented to the Legislature, a supplement to the charter was passed in the year 1839, authorizing the Company to construct dams of eight feet from pool to pool, and requiring the locks to be not less than one hundred and ninety feet long by fifty feet wide in the chamber; and upon this basis the navigation was constructed from Pittsburgh to Brownsville, a distance of over fifty-five miles; the ascent between these points being somewhat in excess of 33½ feet.

The completion of the work to Brownsville was finally effected in November, 1844. It was accomplished under the pressure of great financial difficulties and other heavy discouragements. The citizens who would be most largely benefitted by the improvement, and who ought to have been most active in promoting the objects of the Company, were lukewarm, having little or no faith in the success of the enterprise, and therefore refused to subscribe to the capital stock of the Company, or even to invest their money in its bonds. The natural result was, that the Company found itself without funds for carrying on their work, and in the year 1843, were unable to pay the amount due to its contractors, so that its personal property was sold under the hammer of the Sheriff. In the fall of that year a few enterprising gentlemen, chiefly citizens of Pittsburgh, undertook to complete the work to Brownsville, furnishing the necessary capital, and receiving in payment the bonds of the Company, and so much of the tolls as should remain after paying the necessary expenses of operating the works and keeping them in repair. By this means the work was constructed to Brownsville, as already stated.

In June, 1854, the Company contracted for the construction of Locks and Dams Nos. 5 and 6, which were completed in 1855, extending the slack-water navigation to Geneva.

The erection of Lock and Dam No. 7, which, as before stated, is expected to be completed during the present year, by connecting with the Government work now partly in process of construction and partly completed, will fulfil the obligation of the

Company under its charter, and furnish a complete slack-water navigation not only up to, but beyond the limit of the Virginia State line.

But this is not all the work which has been accomplished by the Company. As already stated, the first four locks were constructed of the size required by our charter, but the rapid increase of the coal business demonstrated the necessity of something more being done to supply the requirements of the trade. In order to meet this demand, the Company, although still heavily in debt, proceeded to construct an additional lock at Dam No. 1, and of larger size than that called for by their charter, being two hundred and fifty feet long by fifty-six wide in the chamber. At this time the Company was not paying any dividends to its stockholders, and was obliged to increase its bonded indebtedness, in order to enable it to afford this increased facility to the coal trade.

In September, 1852, the Company further enlarged the facilities for passing coal, by contracting for the construction of a second and enlarged lock at Dam No. 2.

These efforts on the part of the Directors of the Company, were prompted by an earnest desire, not merely to fulfil to the utmost the requirements of the law, but also to meet promptly and liberally all the demands of that important business, the coal trade of the Monongahela Valley, which owes, if not its very existence, yet certainly its extraordinary prosperity to the Monongahela Navigation Company.

We make these statements not in any spirit of boasting, but in order to show to the stockholders that the Officers of the Company have had their best interests always at heart, and that they have ever, in the midst of almost insuperable obstacles, kept fully abreast of the necessities and legitimate demands of that special branch of business which is so important to the prosperity of our citizens and those of the Monongahela Valley, and which it has been our chiefest object to foster and promote.

In this connection we may state, that the new Lock No. 3, now under contract, will be of larger dimensions than any heretofore constructed by the Company, being of sufficient size to permit of the passage at one time of three barges and their towboat. This enlarged capacity will greatly facilitate the business, and by permitting of the passage of an entire tow by one lockage, will, it is hoped, effectually prevent the recurrence of those delays which have heretofore unavoidably occurred.

The gradual increase in the size of the locks, as new ones have been constructed, has led to a corresponding enlargement of the barges employed in the transportation of coal. The width of coal barges on the Monongahela river has heretofore usually been 24 feet, but now they are generally made 25 feet in width, which increase we regard as unfortunate, because when so constructed, two barges abreast cannot pass through the old locks, which are only 50 feet in width. The consequence is, that in times of a rise in the river, when there are a large number of boats to be passed, a great and unnecessary delay arises, as the size of these boats preventing their passage through them, the old and smaller locks frequently, in times of the greatest crowd and pressure, remain in a measure unused, thus reducing the capacity for passing boats nearly one-half.

It is estimated that the cost of the proposed new work, Lock and Dam No. 7, together with the new locks at Dams Nos. 3 and 4, will require an expenditure of over four hundred thousand dollars, which must be provided for either by an increase of the bonded debt or of the capital stock of the Company. In either way, doubtless the desired end can be secured, but the more proper way would seem to be to increase the capital stock, so as fairly to represent the cost of construction of the improvement. So soon, therefore, as the Board are prepared to do so fully, and at an early day, this matter will be laid before the stockholders and submitted to them for their consideration and action.

The amount heretofore charged on the books of the Company to the account of construction, is . . .	$1,120,100.20
While the total capital stock is only . .	1,004,650.00
Leaving the sum of	$115,450.20

which is not represented by stock.

The receipts of the Company from tolls during the past year, is as follows;

From Coal and Slack, ...	$148,952.82
" Coke, ...	5,212.57
" Steamboats, Freight, &c. . .	60,366.26
" Passengers, ...	2,406.45
	$216,938.10

The total amount of coal, slack and coke passed over the improvement during the year is, of coal and slack, 86,254,660 bushels or 3,277,677 tons, and of coke, 3,780,700 bushels or 75,614 tons.

The extraordinary expenditure required to meet the cost of the repairs and partial re-construction of Dams Nos. 1 and 3, in addition to the ordinary amount required to keep the work in good repair, exceeding as has been stated, the sum of fifty thousand dollars, was nearly met by the Contingent Fund, which has been accumulated from time to time out of the earnings of the Company, in order to meet these extraordinary and unforeseen demands. The Contingent Fund is, therefore, now exhausted, but it will be the care of the Board to replace the amount as they may be able so to do without trenching, it is to be hoped, upon the dividends.

Few changes have been made during the year in the employees of the Company, who have faithfully discharged their respective duties; the only person whose services we loose, is Mr. Limerick Connell, Lock keeper at No. 1, whose failing health necessitated a change. His place has been supplied by transferring Mr. William P. Speakman to Lock No. 1, from No. 4, and the vacancy thus created has been supplied by appointing Mr. J. K. McGowan, the son of our efficient Superintendent of Repairs.

Mr. L. Connell has been a faithful servant of the Company for thirty years past, and it is only due to him to record that he leaves behind him a bright and pure record of honest and faithful service.

Mr. Thomas McGowan still retains his important position as Superintendent of Repairs, a post which he has faithfully and energetically filled; we regret to say that his health suffered owing to exposure during the extremely cold and inclement weather in March and April last, when the disastrous condition of the works before referred to, called for the untiring exertions of himself and his gang of able-bodied men, many of whom were thereby laid upon beds of sickness.

In view of the character and amount of repairs required to be done to Dams Nos. 1 and 3, and of the contemplated extension of the improvement, it became necessary to secure the services of a competent Engineer, and Mr. J. H. Harlow was elected to fill this position and entered upon his duties on the 1st of March last. In this capacity he has rendered valuable service, during the repairing of the dams, in superintending the work and inspecting and measuring the material, in making plans for and attending to the erection of machinery for operating the gates and moving boats at Lock No. 1, and in preparing plans and specifications for Lock and Dam No. 7, and for the new lock at No. 3.

Mr. W. P. Wood, our efficient Cargo Inspector, still remains in discharge of his duties.

We are again forcibly reminded of our mortality by the loss of another from our Board of Managers, consisting of only ten members. In our report for 1879 we had to record the death of Hon. James Veech; last year of John Moorhead, Esq., and now it becomes our sad duty to add to the list of the departed, the name of Daniel Wallace, Esq., who died on the 7th August of this year.

In testimony of his worth and of our sense of the loss which we, as a Board, in common with the community among whom he resided, have sustained by his death, the Board adopted a minute which will be found appended to our report.

For further information in detail of the business and financial condition of the Company and of the present condition of the improvement, we refer to the reports of the Treasurer, the Cargo Inspector, the Engineer, and Superintendent of Repairs.

The Board have authorized the payment to the stockholders of a dividend of six per cent. for the past six months, in addition to the dividend of four per cent. declared in last July.

Respectfully submitted, by order of the Board.

J. K. Moorhead,
Pittsburgh, Jan. 12th, 1882. *President.*

In Memoriam.

DANIEL WALLACE.

DIED AUGUST 7TH, 1881.

WHEREAS, it has pleased Almighty God in his wise providence, to which we humbly bow, to remove from our midst another of the members of this Board, it is hereby ordered that the following resolution be entered upon the minutes, and that a copy thereof be sent to the bereaved family of the deceased.

Resolved, that in the decease of our friend and fellow member, DANIEL WALLACE, this Board and the corporation we represent, have lost a worthy and useful member, a modest gentlemen, an honest and wise man of business, whose loss we deplore; and that we deeply sympathize with his mourning friends.

ENGINEER'S REPORT.

Pittsburgh, Pa., January 2, 1882.

Hon. J. K. Moorhead,
Pres. Monongahela Nav. Co.,

Dear Sir:—March 1st, 1881, when I was appointed Engineer for the Company, Dams 1 and 3 were broken. The break at No. 1 was one hundred and forty feet wide, and had been washed out about forty feet deep, below the top of the dam.

The break at No. 3 was at this time about one hundred feet wide, but the subsequent high water took out about fifty feet more, so that when the break was repaired it was one hundred and fifty feet wide and thirty-five feet deep. During March, which was a very cold, windy and stormy month, accompanied with high water, but little could be done except to obtain the necessary timber, stone and boats to work with. Before beginning work on the cribs, some 2,400 cubic yards of clinker from a blast-furnace were put in the break at No. 1, and the maximum depth reduced from forty to thirty feet. The filling up of ten feet in the bottom, gave us a more even foundation for the cribs.

As a means of holding the cribs in position during construction, anchorage cribs were built and sunk a short distance above the break. The cribs for the repair of the dam were built in place, except some eight to ten feet of the bottom, as the depth of the water above the break was but about twelve feet.

The first crib was successfully sunk March 31st, on the side of the break next to the lock, and April 8th the second crib was sunk on the opposite side of the break.

With the placing of the second crib, the river was forced through a width of about forty feet, and over cribs 1 and 2, and this very materially increased the velocity of the water through the gap; and the building of the third and last crib was a most difficult operation, but April 29th the crib was in position and ready to sink. During the night of April 29th, the lines holding the crib in position broke and the crib lodged on a bar below the dam. Preparations were immediately made to replace the crib back in position; and May 16th, the crib was sunk as originally intended. In this break there was used 31,465 lineal feet of timber and 11,343 cubic yards of stone and clinker. This description does not convey an idea of the difficulty experienced in making the repairs, and it may be better understood when it is remembered that the whole flow of the Monongahela river was passing through the break, the width of which was reduced as each successive crib was sunk, and as a result, greatly increasing the velocity. During the time these cribs were being sunk, the rain or water from the river encased everything in ice, and as the cribs were built in place it required great caution on the part of the men when working. It would have been extremely unpleasant to have slipped off the crib on the outside, but it would have been sure death to have fallen on the inside, as the strong current would have forced a man's body against the timbers, and he would have been drowned before he could have been rescued.

The work was much easier done than I thought possible before commencement, and it seems to me the break was stopped as quickly as any reasonable person would expect under the circumstances. Below I give a copy of the meterological report for the months of March and April, 1881, as taken from the U. S. Signal Service at Pittsburgh, Pa., showing the extreme cold weather.

Day of the Month.	MARCH, 1881.					APRIL, 1881.				
	Temperature.			Rain Fall. Inches.	Stage of water in Mon. River.	Temperature.			Rain Fall. Inches.	Stage of water in Mon. River.
	Max.	Min.	Mean.			Max.	Min.	Mean.		
1	25°	19°	21.5°	0.19	9′ - 7″	34°	25°	29.0°	0.16	5′ - 6″
2	36	20	29.2	0.01	9 - 3	32	25	28.2	0.03	5 - 4
3	37	27	34.0	1.03	8 - 4	34	24	30.2	0.04	5 - 0
4	35	24	26.2	0.11	8 - 0	33	23	27.0	0.02	4 - 8
5	29	20	26.0	0.05	7 - 8	32	17	26.5	0.01	4 - 7
6	40	28	34.7	0.17	7 - 1	32	22	29.2	......	4 - 7
7	46	33	39.0	......	6 - 4	48	27	39.0	......	4 - 4
8	44	30	39.5	0.01	6 - 2	51	32	43.0	......	4 - 7
9	45	36	38.5	0.13	6 - 4	47	37	41.7	0.03	6 - 0
10	50	33	39.7	......	7 - 0	57	36	46.7	......	7 - 4
11	40	25	32.7	......	8 - 0	59	39	51.0	0.05	9 - 2
12	49	28	39.2	0.44	8 - 0	52	44	49.2	0.33	10 - 6
13	44	37	38.7	0.05	8 - 1	47	38	40.2	0.44	13 - 3
14	40	32	37.2	......	9 - 0	49	34	41.2	0.01	18 - 6
15	59	34	49.2	......	9 - 0	55	32	41.7	0.01	16 - 0
16	61	43	53.0	0.02	8 - 0	57	38	46.7	0.12	12 - 2
17	55	43	49.0	0.06	8 - 7	63	38	50.2	0.24	10 - 3
18	49	34	42.7	0.03	10 - 3	47	42	44.5	0.24	9 - 9
19	57	42	49.7	0.18	11 - 4	64	37	52.7	......	10 - 1
20	49	36	38.2	0.03	12 - 9	61	46	51.0	.....	10 - 6
21	38	33	34.2	0.05	14 - 6	66	39	54.2	......	10 - 4
22	36	31	32.7	0.05	13 - 0	70	44	57.7	......	9 -11
23	40	29	35.2	......	10 -11	75	43	61.0	......	9 - 6
24	48	33	42.5	......	9 - 4	86	46	67.0	......	9 - 2
25	47	34	38.5	......	8 - 4	73	61	67.7	0.03	8 - 8
26	38	38	31.7	......	7 - 9	78	59	66.2	......	8 - 5
27	42	27	34.5	......	7 - 1	76	52	64.2	......	8 - 0
28	51	27	42.0	......	6 - 4	73	55	63.5	0.04	7 - 9
29	41	30	37.2	0.16	5 - 9	66	52	57.0	0.23	7 - 0
30	38	29	31.6	0.45	5 - 6	62	42	51.0	......	6 - 4
31	35	29	32.5	0.13	5 - 7					
Total & Aver'g's.	43.4	30.8	37.1	3.35		56.0	38.3	47.4	1.81	

After the three cribs had been placed at No. 1, but before the top slope was finished, the repairs were commenced at No. 3. The first crib was sunk without difficulty, but with the second one we were not so fortunate. All the timber work of the second crib had been built and partly filled with stone (some 640 yards), but a sudden rise in the river occurring before it could be sufficiently loaded, the crib was washed out and towed to the lower side of the dam and held there until June 29, when the river fell sufficiently to allow it to be successfully sunk in place. In the break at No. 3, 19,400 lineal feet of timber and 8,143 cubic yards of stone were used. July 10th all the breaks were repaired and the river in its normal condition.

In the early part of the season a contract was made with Messrs. Morrisson, Abrams & Co., of Monongahela City, Pa., to build and place on the middle wall at Lock No. 1, machinery for opening and closing the lock gates. The machinery consists of an engine stationed about midway of the wall between the two locks, and connected with a line of three and one-half inch shafting, which runs the entire length of the wall, having at the proper points, frictional clutches, by which the capstans and the drums for opening and closing the gates are worked. With this machinery a gate can be opened in about twenty-five to thirty seconds, or in one-eighth the time it required by hand.

In the latter part of the spring the lower end of the easterly wall of the small lock at No. 2, began to fail to such an extent that it was thought best to have the materials ready for use to re-build it during the low water season. Accordingly in June, a contract was made with J. G. Gallagher, of Baden, Pa., for cut stone to use on the face of the wall, the intention being to use the old stone for backing.

The work of removing the wall was begun August 31st, and September 7, when about five hundred cubic yards had been removed and a coffer-dam built, the large lock was closed to boats. September 15th the wall had been rebuilt to above water line, and the large lock was again opened for service; passage through being interrupted only nine days. The time required to remove and re-build this wall, was twenty-nine days, in which over one thousand cubic yards of stone masonry were handled.

In October and November surveys and plans for a lock and dam, to be located below Jacobs Creek, and known as No. 7, were made and proposals were asked for up to December 22nd.

At the time stated in the advertisement, six proposals were received. The proposal of the lowest bidder, Messrs. Harrold & McDonald, was accepted.

Surveys for a second lock at Dam No. 3, has been made, and plans will soon be in a condition to invite bids.

It may be proper to state here, that in making the repairs at Dams Nos. 1, 2 and 3, great credit should be given to Mr. Thomas McGowan, the Superintendent of Repairs.

Respectfully,

J. H. Harlow,

Engineer.

REPORT OF THE SUPERINTENDENT OF REPAIRS.

REPAIRS.

Repairs on the improvement the past season, have been unusually heavy, owing to the severity of the winter of 1880 and '81, heavy ice formed in all the pools, which caused serious damage to some of the dams. Much anxiety was felt for the safety of the upper dams, as the ice was heavier in these pools than below; the heaviest gorge ever known since the improvement was built, had formed in pool No. 6, but as there was no property in danger of being destroyed the ice was permitted to remain until a rise came to carry it out, when it passed over the dams doing little damage.

With a view to save a large amount of coal loaded and moored in the lower pools, the ice was frequently broken up in freezing weather, tumbling over the dams in heavy masses, wearing and tearing the sheeting off the lower slope, exposing the cribbing and stone filling to the action of the water and heavy bodies of ice, causing a breach in Dams Nos. 1 and 3, and seriously wrecking the lower slope of No. 2.

LOCK NO. 1.

A cofferdam was put across the upper end of the large lock; the upper mitresill was repaired and all gates and wickets repaired. The lower gate on the shore wall of small lock was taken down and repaired, and two new wickets put in. In addition to ordinary repairs an engine and machinery were placed on the middle wall of these locks to facilitate the working of the lock and passage of boats.

Dredging was done above and below the lock to improve the channel.

A breach in the middle of the dam about 160 feet long, washed out 35 feet deep was repaired, the balance of the dam being much injured, was put in good repair. 470 feet of the lower slope was raised on an average of about 3 feet, requiring a large quantity of new sheeting, crib timber and stone filling.

Some new sheeting and a large quantity of gravel were put on the upper slope. A crib was built at the outside of the lock.

LOCK NO. 2.

About 70 feet of lower end of shore wall of small lock was taken down and rebuilt; a cofferdam was built and water pumped out to get a good foundation; both the lower gates in small lock were taken down and repaired and one new wicket put in; a new gate placed in upper end of small lock; all the gates in large lock taken down and repaired.

Crib outside and below lock repaired; some dredging was done; a turbine water wheel has been placed in position at the lower end of shore wall to propel machinery for working gates and moving craft in and out of lock.

The dam was well filled with stone and the lower slope covered with new sheeting where the old had been worn out and torn away.

LOCK NO. 3.

Little work was necessary at this lock, some of the gates were taken down and repaired; some work was done to ice breaker, and dredging was done above and below the lock.

A breach similar to the one in No. 1 dam, only this one was in the end of the dam next the lock, and requiring nearly the same amount of material, was permanently repaired at a much less expense for labor, owing to a more favorable condition of the river for doing the work, and less annoyance from boats trying to force their way up and down through the break; the lower slope of this dam was raised nearly the entire length, filled with stone and all newly sheeted; some new sheeting put on upper slope and the dam all well graveled.

A new roof was put on the dwelling occupied by the Collector, and the house was otherwise repaired inside and out.

LOCK NO. 4.

One new gate was put in lower end of outside wall; the other three gates taken down and repaired; one new wicket put in gate in upper end of shore wall; the upper end of outside wall rebuilt with new stone; some repairing done to ice breaker; the dam was filled with stone where needed, old sheeting respiked and new put on where any was taken off; the abutment at the east end of the dam was repaired.

The water wheel and machinery at this lock was, as at all the locks below, repaired and put in good working order, with some alterations in some of the machinery.

LOCK NO. 5.

Some light repairs were done to lock gates, the low crib outside of lock was filled with stone and some new covering placed on it; places where stone had worked out of the dam were filled and new sheeting put on where sticks were off.

LOCK NO. 6.

A leak under the lower mitresill was stopped; the upper gates being old, required considerable repairs, which was done by putting in some braces and new plank on both sides; the ice breaker underwent slight repairs; the dam was put in good order. All empty cribs were filled with stone, some new sheeting put on both upper and lower slope and all loose timbers spiked.

The whole improvement is now in excellent condition and repair.

Several new gates will have to be built the coming season, to replace some that are getting old.

Thomas McGowan,
January 2, 1882. *Superintendent of Repairs.*

* * *

REPORT OF CARGO INSPECTOR.

STATEMENT OF THE BUSINESS

On the Monongahela Slack-water during the year ending December 31, 1881.

Receipts from	Total.
Coal and Slack,	$148,952 82
Coke,	5,212 57
Freight, Empty Crafts, Steamboats, Timber, &c.,	60,336 26
Passengers,	2,406 45
Total,	$216,908 10

Receipts at the several Locks.

Lock No. 1,	$ 40,972 17
" " 2,	101,357 63
" " 3,	30,307 18
" " 4,	37,959 34
" " 5,	1,590 70
" " 6,	4,721 08
Total,	$216,908 10

Trade of Pool No. One.

Towboats,	2,589
Empty Crafts,	3,995
Total,	6,584
Number of Clearances issued Eastward,	1,977
" " " " Westward,	5,292
Total Number of Clearances issued in 1881,	7,269

Comparative Statement of Toll Receipts for the years 1880 *and* 1881.

	Coal.	Coke.	Freight, &c.	Passengers.	Total.
Tolls for 1880,	$149,280 45	$6,214 56	$74,696 68	$6,737 50	$236,929 19
Tolls for 1881,	148,952 82	5,212 57	60,336 26	2,406 45	216,908 10
Decrease for 1881,	$327 63	$1,001 99	$14,360 42	$4,331 05	$20,021 09

STATEMENT

Of Freight shipped East and West on the Monongahela Slack-water during the year ending December 31st, 1881.

Shipped Eastward from Pittsburgh.			Shipped Westward to Pittsburgh.		
Whiskey, . . .	bbls.,	96	Sand, ...	bushels,	235,200
Lumber, . . .	feet,	10,496,850	Whiskey, . . .	bbls.,	3,587
Timber, ...	"	3,220,467	Wood, ...	cords,	300
Iron Ore, . . .	tons,	10,094	Stone, ...	perches,	8,505
Pig Iron, . . .	"	465	Staves, ...	No.,	5,000
Fire Clay, . . .	"	1,288	Posts, ...	"	7,430
Pit Posts, . . .	No.	295,200	Brick, ...	"	881,400
Sheep and Hogs, .	"	164	Sheep, ...	"	1,856
Cattle and Horses,	"	205	Lumber, . . .	feet,	439,900
Railroad Ties, .	"	16,500	Timber, . . .	"	776,050
Classified Freight,	lbs.	21,036,250	Steel Rails, . .	tons,	21,801
			Hogs, ...	No.,	3,130
			Cattle and Horses,	"	177
			Classified Freight,	lbs.,	9,859,800

PASSENGER RETURNS

Of the several Boats navigating the Monongahela Slack-water in 1881.

Boats.	Passengers.		No. of Locks.	Davidson's.	Geneva.	Total.
	Through.	Way.				
Germania, ...	1,555	2,741	5,547	1,044	1,059	$746 45
Geneva, ...	1,553	3,969	6,009	954	1,314	790 15
Snowden, ...	987	1,464	2,815	579	401	407 20
Elizabeth, ...		5,899	8,130			406 50
Excel, ...		763	1,123			56 15
Total, ...	4,095	14,836	23,624	2,577	2,774	$2,406 45

Passenger Bussiness for 1880 *and* 1881 *Compared.*

	1880.	1881.	Difference.
Through Davidson's and Geneva Passengers, . . .	20,675	9,446	11,229 decrease.
Way Passengers, ...	43,060	14,836	28.224 "
Total, ...	63,735	24,282	39,453 decrease.
Tolls on Through Passengers,	$3,020 10	$1,225 25	$1,794 95 decrease.
" " Way "	3,717 40	1,181 20	2,536 20 "
Total, ...	$6,737 50	$2,406 45	$4,331 05 decrease.

Comparative Receipts in 1880 *and* 1881.

Months.	1880.	1881.
January, ...	$25,192 53	$ 6,913 10
February, ...	27,782 32	11,993 79
March, ...	37,015 08	29,110 03
April, ...	25,550 45	32,643 13
May, ...	16,487 65	19,616 44
June, ...	15,779 63	27,315 27
July, ...	10,284 74	17,371 10
August, ...	10,260 14	7,191 76
September, ...	18,994 46	1,329 35
October, ...	10,527 49	2,193 66
November, ...	19,888 72	27,547 68
December, ...	19,165 98	33,682 79
Total, ...	$236,929 19	$216,908 10

STATEMENT

In Bushels of Coal, Coke and Slack Shipped from the several Pools of the Monongahela Slack-water during the year 1881.

Months.	Pool No. 1.	Pool No. 2.	Pool No. 3.	Pool No. 4.	Total.
January, . .	611,000	2,426,500	395,800	233,600	3,666,900
February, . .	214,500	3,429,000	650,000	708,200	5,001,700
March, . . .	73,200	7,319,500	2,123,700	2,922,500	12,438,900
April, . . .	1,656,000	6,211,500	2,490,900	2,511,900	12,870,300
May, ...	1,079,500	4,825,000	494,500	1,048,000	7,447,000
June, . . .	1,828,460	7,072,500	1,429,000	1,708,400	12,038,360
July, ...	430,000	4,045,000	972,000	1,075,900	6,522,900
August, . . .	16,000	766,500	396,800	559,000	1,738,300
September, . .		126,000	77,100	57,900	261,000
October, . . .	13,000	201,000	305,100	28,400	547,500
November, . .	1,077,000	5,073,000	2,214,600	2,068,800	10,433,400
December, . .	1,714,600	6,449,000	2,599,300	2,525,500	13,288,400
Total, . .	8,713,260	47,944,500	14,148,800	15,448,100	86,254,660

Coke Business for 1881.

Bushels—from Pool No. 1, ...	134,500	$ 100	87
" " " " 2, ...	3,330,000	4,495	50
" " " " 4, ...	87,200	158	20
" " " " 6, ...	229,000	458	00
Total number bushels Coke, . . .	3,780,700	$5,212	57
Bushels Coal, ...	86,254,660	$148,952	82
" Coke, ...	3,780,700	5,212	57
	90,035,360	$154,165	39

Comparison of the Coal and Coke Business for 1880 *and* 1881.

	1880.	1881.	
Total number of Bushels, .	89,377,150	90,035,360	658,210 increase.
Tolls on Coal and Coke, .	$155,495 01	$154,165 39	$1,329 62 decrease.

I certify the foregoing to be correct.

W. P. Wood,
Cargo Inspector.

Pittsburgh, January 12, 1882.

OFFICE MONONGAHELA NAVIGATION COMPANY.

REPORT OF TREASURER MONONGAHELA NAVIGATION COMPANY.

Dr. Abstract of Receipts and Disbursements for year ending January 11, 1882. Cr.

Receipts.		Disbursements.	
Cash balance January 8, 1881,	$ 64,081 99	New Construction,	$ 4,648 20
Tolls received in cash,	40,776 01	Lock and Dam No. 7,	192 10
Toll bills collected,	136,368 45	Expenses,	38,305 33
Bills receivable,	22,500 00	Repairs,	79,069 44
Pumping Boat,	6,967 50	Dividends paid,	99,974 00
Steamboat "Keefer," on account,	5,000 00	Coupons paid,	4,920 00
Interest,	2,000 00	State Treasurer,	13,292 83
B. L. Wood, Jr.,	43 50	Trustee account,	1,500 00
		W. P. Wood,	1,911 49
		Steamboat "Keefer" (cost),	9,500 00
		Cash on hand January 11, 1882,	24,424 06
	$277,737 45		$277,737 45

I certify the foregoing to be correct.

W. BAKEWELL,
Treasurer.

Pittsburgh, January 12, 1882.

OFFICE MONONGAHELA NAVIGATION COMPANY.

REPORT OF TREASURER MONONGAHELA NAVIGATION COMPANY.

Profit and Loss for year ending January 11, 1882.

Dr.		Cr.	
Expenses,	$ 38,305 33	Balance January 8, 1881,	$ 69,480 08
Repairs,	79,569 44	Tolls,	216,908 10
Tax on Capital Stock,	5,023 25	Contingent Fund,	50,000 00
Tax on Gross Receipts,	1,517 78	Suspense Account,	1,403 40
Tax on Loans,	292 00	For use of Pumping Boat,	6,967 50
Coupons,	5,040 00	Interest,	2,070 00
Dividend No. 52, January, 1881,	60,279 00		
Dividend No. 53, July, 1881,	40,186 00		
Balance January 11, 1882,	116,616 28		
	$346,829 08		$346,829 08

I certify the foregoing to be correct.

Pittsburgh, January 12, 1882.

W. BAKEWELL,
Treasurer.

Office Monongahela Navigation Company.

REPORT OF TREASURER MONONGAHELA NAVIGATION COMPANY.

Balance Sheet, January 12, 1882.

Dr.			Cr.
Construction,	$1,120,100 20	Capital Stock,	$1,004,650 00
Lock and Dam No. 7,	192 10	Bonds,	84,000 00
Cash,	24,424 06	Scrip,	802 00
Toll Bills,	69,824 35	Sinking Fund,	50,000 00
W. P. Wood,	1,916 49	Trustee Account,	7,157 67
Pittsburgh City Bonds,	7,290 00	Suspended Account,	1,392 90
Allegheny County Bonds,	21,735 00	State Treasurer,	1,109 35
Bills Receivable,	24,070 00	Coupons unpaid,	2,685 00
		Dividends unpaid,	1,139 00
		Profit and Loss,	116,616 28
	$1,269,552 20		$1,269,552 20

I certify the foregoing to be correct.

W. Bakewell,
Treasurer.

Pittsburgh, January 12, 1882.

OFFICE MONONGAHELA NAVIGATION COMPANY.

PITTSBURGH, January 12, 1882.

Pursuant to public notice, the annual meeting of the Stockholders of the Monongahela Navigation Company, was held at their office, No. 20 Grant Street, Pittsburgh, at 2 o'clock, P. M.

On motion of Gen. J. K. Moorhead, the meeting was organized by calling Mr. H. B. Goe to the chair.

On motion of Mr. Hogg, Mr. James K. Bakewell was chosen Secretary of the meeting.

The President of the Company, Hon. J. K. Moorhead, presented the annual report of the Managers, together with the several reports of the Treasurer, the Cargo Inspector, the Engineer, and the Superintendent of Repairs.

On motion of Mr. Brunot, it was resolved that the reports of the Board of Managers and the accompanying reports, as presented by the President of the Company, be accepted, that the reading of these reports be dispensed with, and that the Board of Managers be instructed to have the same printed in pamphlet form for the use of the stockholders.

On motion of Mr. Bakewell, it was resolved that the election of Officers and Managers of the Company, be now proceeded with, and that Major Wm. J. Moorhead act as Judge of Election, and that the Chairman and Secretary of the meeting act as Tellers.

After the polls were closed, the Tellers reported that the following named persons were duly and unanimously elected as Officers and Managers of the Company for the ensuing year, each of said persons having received 9180 votes, viz:

For President—J. K. Moorhead.

For Secretary and Treasurer—W. Bakewell.

For Managers—Joseph Albree, Alexander Bradley, Felix R. Brunot, John Harper, N. B. Hogg, Max K. Moorhead, William Morrison, J. B. Murdoch, J. B. Sweitzer, and Allan C. Bakewell.

On motion, the meeting then adjourned.

J. K. BAKEWELL,
Secretary.